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ABSTRACT

The AGS Early Screening Profiles (AGS:ESP) instrument (P. Harrison, 1990) has been introduced recently as a screening instrument for predicting mental ability. A study was conducted to determine the degree of concurrent validity between the AGS:ESP and the Stanford Binet Fourth Edition (SB:FE), an instrument often used by psychologists to detect mental impairments in children. Subjects were children from Illinois who attended the Head Start Program. Four hypotheses were tested: (1) that there would be a significant positive correlation between the AGS:ESP Cognitive/Language Profile score and the SB:FE Test Composite score; (2) that there would be a significant positive correlation between the AGS:ESP Cognitive/Language Profile score and the SB:FE Standard Area scores; (3) that there would be a significant positive correlation between the AGS:ESP Cognitive and Language subscale scores and the SB:FE Test Composite score; and (4) that there would be a significant positive correlation between the AGS:ESP Cognitive and Language subscale scores and the SB:FE Standard Area scores. All of these hypotheses were supported, and results also support the use of the AGS:ESP as a screening instrument for use with preschool children from low income families. (Contains 4 tables and 34 references.) (SLD)

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ED 427 047

A Validity Study of the AGS Early Screening Profiles with the Stanford-Binet Fourth Edition as Criterion

by Michelle R. Genteman, Bachelor of Arts

A Thesis Submitted in Partial
Fulfillment of the Requirements
for the Master of Science Degree

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Chapter I

Introduction

With increased passage of legislative bills to identify handicapped children, screening instruments have become an important detection device. Federal support began in 1964 with the passage of the Mental Retardation Act which provided financial support for the education of handicapped children. Today, identifying and serving handicapped preschool children has become a primary initiative. This was made possible in 1986 through Public Law 99-457, The Education of the Handicapped Amendments Act.

The rationale for interventions for at-risk children is supported in several ways. First, research supports the idea that early experiences of children are important to their development. Second, research indicates that negative developmental risk factors have a spiraling effect throughout a child's life. These risk factors include the family, environment, and socioeconomic factors as well. Last, early intervention programs and services cost less than later special education services (Harrison, 1990).

Because young handicapped children can be provided with early intervention services, it is necessary to identify them. This can be accomplished by screening children who are known to be at risk. One of the main reasons for screening is to identify children in need of preventive action (Leach, 1983). Rationale

for the early detection of cognitive delays is well established (Satz and Fletcher, 1988).

The AGS Early Screening Profiles(AGS:ESP) is designed to identify children who have possible handicaps, as well as those who might be gifted. This screening instrument has been designed for children who range in age from 2 years, 0 months to 6 years, 11 months. It is easy to administer and only takes approximately 15-30 minutes. Because the screening instrument is relatively new, validity studies are not yet available. Thus, it is important to test the AGS:ESP against an instrument that has been demonstrated to be valid and reliable with an at-risk population.

The Stanford-Binet: Fourth Edition(SB:FE) is such an instrument. The SB:FE was designed to be a diagnostic instrument that can be used to identifying children who are mentally retarded and learning disabled, to aid in understanding why a child is having difficulties in school, to identify gifted students, and to study the development of cognitive skills (Thorndike, Hagen, and Sattler, 1986).

The purpose of this study is to add to the limited data concerning the validity of the AGS Early Screening Profiles instrument. Specifically, the accuracy of the AGS Early Screening Profiles will be assessed by identifying children in need of intervention services by comparing the screening results with results from the SB:FE. Cutoff scores that maximize the correspondence between the group of children that is referred and the group of children who have special problems will also be determined.

Chapter II

Review of Literature

History and Development of Early Childhood Education

The assessment of preschool children has changed drastically since the first tests of mental achievement were developed. This movement is generally seen as emerging in the 1960's. Federal funding was increased during this time to measure the impact of programs and assessment instruments. This made an impact on the advancement of the idea of early assessment and intervention. Funding was provided first in 1964 by the Mental Retardation Act and the Economic Opportunity Act which provided financial support for the education of preschool handicapped children. In 1965, the Elementary Secondary Education Act was created which provided improved educational and social opportunities for young children in poverty. These three programs created an awareness of the need for effective program evaluation and preschool assessment instruments (Hohenshil, 1988). Federal support continued in this movement with the 1968 passing of the Handicapped Children's Early Education Assistance Act (PL 90-538). This law, like the other, provided continued support for preschool programs and test instruments. This law also provided financial funding for model preschool programs and evaluation materials related to preschool assessment.

The Education of the Handicapped Act of 1974 (PL 94-142) established "child find" efforts in the identification of children ages birth to 21 years who may be in need of special

services. In 1975 public Law 94-142 was passed. This law was called the Education for all Handicapped Children's Act. This law mandated a free and appropriate public education for all school age children, including handicapped preschoolers (Lichtenstein, 1984). This act has thus become the primary source of funding for preschool children in need of special services. This law also allows "special incentive grants" for preschool children who are identified and served.

With such a large emphasis on providing handicapped as well as nonhandicapped students with an education, assessment of learning deficits and high risk factors have become increasingly more important (Hohenshil & Humes, 1988). Public Law 98-199, The Education of the Handicapped Amendments Act, was created in 1983 which expanded the services to handicapped preschool children as a primary initiative. With these recent changes, it was predicted that there will be significant increases in the number of children who undergo psychoeducational assessments in the future (Bracken, 1987).

With the passage of federal funding to identify handicapped preschool children, assessment instruments were created and published in large numbers. The assessment methods not only identified preschoolers in need of special services, but also served as guides when establishing individualized education plans. Unfortunately, many of these tests which were developed were of poor quality. Of 120 preschool and kindergarten tests available in 1971, it was found that only 7 tests provided good measures of validity (Lehr, Ysseldyke, & Thurlow, 1987).

Model Preschool Programs

Although the interest in early childhood education has increased, providing these services calls for successful screening instruments along with model preschool programs to carry out intervention methods. The Carolina Abecedarian Project is one of these programs. Children were accepted for the program after various information was obtained about the child and his/her family. This information included parental education, parental income, history of mental retardation, history of school failure, and other evidence of social maladaptation. The children who qualified for the study were then separated into the control group, which did not receive any intervention services, and the experimental group where the children attended a child-centered prevention-orientated intervention program. These services were delivered in a daycare setting from infancy to age five. Beginning at 18 months, and every test occasion thereafter, the children in the prevention program significantly outscored the control group children on mental tests (Ramey & Campbell, 1984)..

Another model preschool program was the Ypsilanti Perry Preschool Project which found positive long term effects for children who participated in the intervention program. The subjects were three and four year old children whose parents were considered low income and who scored below average on pretests of mental ability. The participating children had "significantly improved educational performance including high school graduation rates and college attendance; improved rates of unemployment and

self-support; and reduced rated of crime, teen pregnancy, and welfare utilization" (Weikart, 1989).

Horacek, Ramey, Campbell, Hoffmann, and Fletcher (1987) identified 90 children at birth as being high risk for school failure as a result of various economic and social variables. These children were randomly assigned to either a control group or an experimental group where intervention techniques were used. It was found that "educational intervention reduced the incidence of grade failure most when successfully delivered as both a preschool and school-age program.

These programs, as well as many others, all support the use of enrolling children into early intervention programs. This is considered a means of reducing their rate of school failure, after the participating children have been found to be at high risk as a result of a screening measure. Demands for early childhood special education is likely to increase in the future causing a need for more programs (Ensher, 1989). These studies are only a handful of the many success stories of early preschool programs. Research has proven that quality preschool programs provide an immediate boost to the children's performance (Haskins, 1989).

Importance of Screening for High Risk Children

It is important to remember the purpose of a screening instrument. A screening instrument is defined as the application of measurement and observation procedures to large groups of children for the purpose of identifying those who may be at risk

for developmental, learning, or behavior problems (Harrison, 1990; Paget and Nagel, 1986).

Screening instruments are designed to detect children who are at-risk for experiencing learning or behavioral difficulties. Screening instruments are not a substitute for a comprehensive or diagnostic assessment. Screening instruments do not provide a diagnosis, but should be useful in planning further diagnostic information (Harrison, 1990). Screening assessments should be designed to evaluate large numbers of children with economical and brief procedures (Hohenshil & Humes, 1988). The instruments should be easy to administer and efficiently scored and interpreted.

It is important to identify children who are at risk and to intervene with help as soon as possible (Horacek et. al.). "The early detection of children predicted to be at risk for later reading and learning problems has long been recognized as an unmet need in child mental health." (Satz & Fletcher, 1988). Children who are at-risk often experience a negative spiraling effect on the family and interpersonal dynamics (Harrison, 1990). According to Wilson and Reichmuth (1985), screening programs for kindergarten and preschool have become popular based on the belief that identifying learning problems early and intervening will prevent future problems.

The rationale for early detection of children at risk for learning problems is well established, and studies do show improved outcomes for children enrolled in these programs (Diamond & Le Furgy, 1988; Haskins & Alessi, 1989; Horacek

et.al., 1987; Ramey, et al. 1990; Ramey & Campbell, 1984; Thurlow, Ysseldyke, Lehr, & Nania, 1989; Weikart, 1989) Medical literature as well documents the benefits of screening for early detection (Keogh & Daley, 1983).

The number of children at preschool age who receive early intervention services is rising. The states are delivering an increasing amount of services through public schools to children below age five who are identified as at-risk (Widerstrom, Mowder, & Willis,1989). It is important to use screening instruments designed for the preschool population which are effective at identifying at-risk children. The AGS:ESP is designed as a first step in providing these intervention and prevention services to at-risk children (Harrison, 1990).

The AGS Early Screening Profiles

This screening device was normed on children ranging in age from 2 years, 0 months to 6 years, 11 months of age. The instrument is designed to identify those with possible handicaps, as well as those who may be gifted. Those children who are identified as possibly handicapped or gifted by the AGS Early Screening Profiles(AGS:ESP), must be further evaluated before a decision is made concerning the need and type of individualized education those children may require. The goal of the battery is to prevent the occurrence of later problems by identifying children in need of special services, and intervening as soon as possible.

Programs for early identification must consider many areas of influence on a child's development (Keogh & Daley, 1983). The AGS:ESP takes an ecological approach towards the screening of young children. The instrument measures several areas of development. These areas include: cognitive/language, motor, self-help/social, articulation, home, health history, and behavior. These areas are measured through direct testing as well as questionnaires designed for parents, teachers, and day-care providers.

The AGS:ESP can be administered in 15 to 30 minutes, depending on the abilities and the age of the child, while the questionnaires can be completed in 10 to 15 minutes. The instrument is also designed so that it can be administered not only by professionals, but by trained nonprofessionals as well.

There are seven parts to the AGS:ESP. These consist of the Cognitive/Language Profile, Motor Profile, Self-Help Social Profile, Articulation Survey, Home Survey, Health History Survey, and Behavior Survey. Depending on the needs of the screening program, this instrument allows for a combination of subtests or a single subtest to be administered.

Cognitive/Language Components of the AGS Early Screening Profiles

Cognitive/Language Profile

The Cognitive/Language Profile consists of four subtests. Two of these subtests are cognitive while the other two are language. The cognitive subtest consists of the Visual Discrimination and the Logical Relations component. The language

subtests consist of the Verbal Concepts and the Basic School Skills component. Testing time is approximately five to fifteen minutes.

The Verbal Concepts subtest consists of the examiner showing pictures while the child is to describe the picture. As the child advances, there are several pictures on a page and the child is to point to the picture the examiner named.

For the Visual Discrimination subtest, the examiner will point to a stimulus picture, and the child is to point to all the pictures that match the stimulus picture which are located in a row next to the stimulus picture.

For the Logical Relations subtest, the examiner shows the child a stimulus picture and a row of response pictures. The child is then instructed to point to the picture which corresponds with the stimulus picture. The more advanced pictures show a visual analogy in which an element is missing and the child is to point to a picture of the missing element.

The Basic Schools Skills subtest looks at the child's knowledge of quantity, number, size, shape, and identifying numbers letters, and words.

Unique Features of the AGS: Early Screening Profiles

-The battery provides a screening for the major developmental areas related to young children. Public Law 99-457 (Education of the Handicapped Act Amendments of 1986) specifies assessment and intervention in the major areas that the AGS Early Screening Profiles assesses.

-An ecological approach is addressed by the AGS:ESP where not only direct testing is used, but information from a variety of sources as well.

-The AGS:ESP can be administered reliably and scored reliably by nonprofessional, allowing the professionals free for children identified as needing a more comprehensive assessment. The battery also provides reliable information for the amount of time spent on the screening on the child.

-The battery is designed for individual administration of the screening to meet the needs of young children who may have difficulty with group testing. These difficulties may include sitting still, being quiet, and focusing attention on the task at hand.

-Test administrators can elect to administer the entire battery or only specific subtest components. A brief or a detailed scoring system may be used.

-The battery was standardized on a representative national sample. Scoring also allows determination of local norms.

-The manual provides evidence for reliability, validity, and predictive studies.

-The major components of the battery are compatible with more detailed instruments that can be used for more comprehensive assessments.

Standardization

The AGS:ESP was standardized between October 1987 and December 1988 in 26 states and the District of Columbia. There were 1,149 children selected from age 2 years, 0 months through 6 years, 11 months with 50.4% of the total sample female and 49.6% being male.

Four geographic regions were defined: Northeast, North Central, South, and West. The percentage of standardization subjects from each geographic region is similar to the percentage of the U.S. population for children ages 2 years, 0 months through 6 years, 11 months residing in those regions. A slight overrepresentation of subjects from North Central region and a slight underrepresentation of subjects from the Northeast and West regions existed. The children were obtained from randomly selected school districts.

The standardization sample comprised of four racial or ethnic groups. These groups included white, black, Hispanic, and other (Native Americans, Alaska Natives, Asians, Pacific Islanders, and others not classified as white, black or Hispanic). The proportion of each race sample group closely approximates the reported proportions of the U.S. populations.

Parental education percentages for the total sample also closely approximates the reported U.S. population percentages.

However, parents with less than a High School education are slightly underrepresented, while parents with four or more years of college are slightly overrepresented.

The AGS:ESP is a new instrument in which research other than those listed in the manual could not be found at the time this study was written. This emphasizes the important of this study and that other research is valuable concerning this instrument.

Reliability

Reliability refers to the extent of consistency that an instrument measures a characteristic or construct. Coefficient alpha reliabilities were obtained for each domain and subtests of the Cognitive/Language Profile using scores obtained from the standardization sample. Coefficient alphas for each Profile and Total Screening were computed using Guilford's formula for the reliability of the composite. Reliabilities for all Profiles are in the high .80s to mid .90s, with the exception of the motor Profile which ranges from .60 to .78, with a median of .68. Coefficient alphas for the Cognitive/Language Profile subtests are all above .80, with the exception of .78 for children age 6 on the Cognitive subscale. Total Screening coefficients were calculated using all eight possible combinations of two or three Profiles that may be used to obtain a Total Screening. These coefficients are in the high .80s to mid 90s.

Coefficient alphas for the Articulation Survey are generally in the high 80s to low 90s. Home Survey coefficients range from

.37 to .52. Coefficients for the Behavior Survey are generally in the mid 70s.

Immediate Test-retest reliability for the Profiles, Cognitive/Language subscales, and Total Screening are all above .80 with the exception of the Motor Profile which has a coefficient of .70. Correlations for Total Screening standard scores range form .78 to .89 "The immediate test-retest data indicate substantial agreement on the first and second testing and adequate stability of scores over a brief time interval" (Harrison, 1990). Delayed test-retest coefficients for the Profile and subscale standard scores are all above .70 with the exception of the Motor Profile which is .55 Total screening test-retest correlations range from .73 to .83 Test-retest Correlations for Screening Indexes are in the high .60s to .80s, with the Motor Profile being at .31.

Validity

The manual lists the results of over 30 validity studies. Construct validity from the Cognitive/Language Profile ranges from .69 to .83, Motor Profile ranges from .59 to .75. Correlations between profiles and their component subtests ranges from .68 to .79 for the Verbal concepts, .69 to . 75 for the Visual discrimination, .57 to .74 for the Logical Relations, and .62 to .79 for the Basic School Skills. Gross Motor correlations range from .44 to .69 with fine motor correlations from .37 to .64. Correlations between the Cognitive/Language subscales and their component subtests range from .67 to .74 for Visual

Discrimination, .63 to .76 for Logical Relations, .72 to .80 for Verbal Concepts, and .66 to .80 for Basic School Skills. Concurrent validity results are provided in the manual between the AGS: ESP and the SB: FE by Norton. Correlations between the SB:FE and the Cognitive/Language Profile range from .59 to .84. For the cognitive subscale correlations range from .54 to .76 and correlations for the Language subscale range from .56 to .82. Motor Profile correlations with the SB: FE range from .51 to .70.

Chapter III

Statement of the Problem and Hypothesis

Statement of the Problem

The need for screening instruments to detect developmental and cognitive delays in children is becoming increasingly important. Legislation now provides federal, and in some cases, state funding for the identification of handicapped children of preschool ages. Yet in order to identify these children as handicapped, time consuming and expensive assessments are conducted. One way to aid in the identification of handicapped children is to administer a screening instrument. A screening instrument should be brief and inexpensive to administer. A screening instrument should also be accurate with identifying at-risk children who will perform poorly on further diagnostic testing. It is important that a screening instrument accurately identifies those children in need of intervention services before they are of school age.

Many screening instruments claim to be accurate in identifying these children. The SB:FE has often been used as a criterion which many tests have been validated against because it has been demonstrated to be both reliable and valid. The AGS:ESP has been designed to predict performance on more indepth diagnostic evaluations. Therefore it is necessary to determine the degree to which the two tests correlate with each other. Although correlational measures provide information on measures of concurrent validity, they provide no information on subject

identification and predicted outcome group membership (Satz & Fletcher, 1988). Validity coefficients do not indicate the test has utility in and of itself. This design is useful in that a screening instrument may have excellent predictive validity, but may be clinically useless as a screening instrument (Satz & Fletcher, 1988). These results also say little about how the instrument results can be used clinically on an individual basis for placement purposes. Placement determination can be made by determining cutoff scores that assign each subject to a predicted risk group or no-risk group, based on the subject's performance on the screening instrument. This can be accomplished by developing a 2x2 prediction-performance matrix which permits test outcomes of false negative, false positive, true negative, and true positive. This 2x2 array is otherwise known as the hit-rate model. Hit-rate is defined as the percentage of children who are correctly classified as at-risk (positives) or not at-risk (negatives) (Wilson & Reichmuth, 1985).

The purpose of this study is to compare scores obtained on the AGS:ESP cognitive and language components with those scores obtained on the SB:FE to determine if the AGS:ESP instrument can be used as a predictive instrument for mentally impaired children. Only the language and cognitive components of the AGS:ESP will be administered since those components are designed to screen for mental ability. This study will also identify cutoff scores for the population used in this study in order to minimize the number of false positives and false negatives, and

to maximize the correspondence between the group of children that is referred and the group of children who have special problems.

Hypotheses

1. It is predicted that there will be a significant positive correlation between the AGS:ESP Cognitive/Language Profile score and the Composite Standard Score on the SB:FE.

2. It is predicted that there will be a significant positive correlation between the AGS:ESP Cognitive/Language Profile score and the Standard Area Scores on the SB:FE.

3. It is predicted that there will be a significant positive correlation between the AGS:ESP Cognitive subscale and Language subscale scores and the Composite Standard Score on the SB:FE.

4. It is predicted that there will be a significant positive correlation between the AGS:ESP Cognitive and Language subscale scores and the Standard Area Scores on the SB:FE.

5. A hit-rate cutoff score will not be predicted, rather a scattergram will be composed to look at the effects of various cutoff scores on the number of false positive, false negatives, true positives, and true negatives.

Chapter IV

Methodology

Subjects

The subjects were Head Start preschool children who were residents of St. Clair County, Illinois. All were from families whose income was below the Federal Guidelines for low income families. The children all came from families with a highly impoverished background. The subjects ranged in age from 3 years, 9 months to 5 years, 8 months with a mean age of 4 years, 7 months. There were 40 total children who participated in the study, 20 males, 20 females, 5 white, and 35 black. The children were randomly selected by class rosters from 5 Head Start classrooms.

Instrumentation

The SB:FE was selected as the criterion instrument because it has been widely used, and substantial research has been conducted to establish the test as a reliable and valid instrument. The SB:FE is a revision of the 1960 Stanford-Binet: Form L-M (SB-LM). The SB:FE is a general intelligence test devised to assess the general intellectual ability of individuals ranging in age from two years of age to adults. The authors have created a three level hierarchical model of the structure of cognitive abilities which consists of the general reasoning factor, or "g", at the top. The second level consists of the crystallized abilities, fluid-analytic abilities, and short term memory. The

third level consists of the following : Verbal Reasoning, Abstract/Visual Reasoning, Quantitative Reasoning, and Short-Term Memory. These four areas of cognitive abilities are appraised by fifteen tests.

Preschool age children were administered 8 of the 15 subtests which included Vocabulary, Comprehension, Absurdities, Quantitative, Pattern Analysis, Copying, Bead Memory, and Memory for Sentences. Scores were derived from the four third level areas. A Composite Standard Score incorporated all of the area scores to yield one general score (Thorndike, Hagen, & Sattler, 1986).

The SB:FE has proved to be both a reliable and valid assessment instrument. Based upon the Kuder-Richardson Formula 20, the reliability level is high for the preschool population. The Test Composite standard score reliability is .97 for both four and five year old children. The Verbal Reasoning area score is .91 for the four year old age group, and .91 for the five year old age group. The Abstract/Visual Reasoning area reliability is .91 for the four year old population and .93 for the five year olds. The Quantitative Reasoning reliability is slightly lower with the four year old population at .87 and the five year old population at .88. The last area is the Short-Term Memory area with reliability at .90 for the four year old population, and .92 for the five year olds. Test retest reliability yielded a correlation of .91 for the Test Composite score with a time interval of two to eight months between testing sessions (Thorndike et. al., 1986).

Validity was tested using factor analytic procedures which focused on the internal validity for the test. Results indicate that the SB:FE has a substantial "g" loading. For the children ranging in age from 2-6, "g" loadings are as follows: Vocabulary .65, Comprehension .67, Absurdities .69, Bead Memory .58, Memory for Sentences .59, Quantitative .69, Pattern Analysis .69, and Copying .62. High factor correlations are found at all age levels which support that there is a strong "g' component underlying the SB:FE (Keith, Cool, Novak, White, & Pottebaum, 1988).

Substantial associations have been found between the SB:FE's composite and overall scores on SB-LM, all Wechsler scales, the K-ABC, and the Peabody Picture Vocabulary Test (Glutting, 1987). Significant correlations have also been found by Carvajal, McVey, Sellers, Weyand, & Mcknab (1987) between the SB:FE, the Peabody Picture Vocabulary Test, and the Columbia Mental Maturity Scale.

The SB:FE has been verified as a valid instrument by comparing test results with other well established instruments. One study compared the performance of learning disabled students on the WISC-R to results of the SB:FE. Correlations were strong between the two instruments (r=.74; Smith, Martin, & Lyon 1989). Other tests as well have established positive relationships between the WISC-R and the SB:FE (Hollinger & Baldwin, 1990; Lukens, 1990; Phelps, Bell, & Scott, 1988; Rothlisberg, 1987).

Relationships between the SB:FE and the Kaufman Assessment Battery for Children has been established with intercorrelation coefficients for the SB:FE composite score and the K-ABC area

scores ranging from .50 to .80 (Hollinger & baldwin, 1990; Knight, Baker, & Minder, 1990).

Stability if the SB:FE has been investigated by Lamp and Krohn (1990) by administering the SB:FE to a sample of children at age four and again at age six. The SB:FE was found to be highly stable with this group of children.

Procedure

The SB:FE and the AGS:ESP Cognitive/Language Profile were administered to each child. This profile from the AGS:ESP was used alone since it provides a screening primarily for further cognitive and language testing.

Both instruments were administered by a graduate psychology student who had been trained to use the instruments with preschoolers. Tests were administered within a twelve week time period.

Testing was conducted in a private, well lit room at the Head Start center the child attended.

Analysis of Data

Data analysis consisted of calculating Pearson-Product Moment correlation coefficients for the Standard Area Scores from the SB:FE and the Cognitive/Language subtest scores from the AGS:ESP. Correlations between the SB:FE Composite Standard Score and the AGS:ESP Cognitive/Language Profile Score were also calculated using Pearson Product Moment correlations. The hit-rate model will be employed using the prediction-performance matrix proposed

by Meehl and Rosen (1955), between the AGS:ESP Cognitive/Language Profile score and the SB:FE Test Composite score.

The hit-rate model summarizes the relationship between results of a screening instrument and the "actual" status of the individual. Actual status is the classification outcome on a comprehensive criterion measure such as the SB:FE. Children who participate in screening measures fall into one of two actual screening outcomes and one of two actual status categories, creating four possible results for each child. A child may be referred for a comprehensive evaluation and found to be in need of special services, thus an accurate decision or a true positive. A second accurate decision is when a child performs adequately on a screening instrument who is not referred and is found to not be in need special services, thus a second type of accurate screening decision or a true negative. A child may also be referred by the screening instrument and need no special services, thus a false positive or over-referral rate. Last, a child may be referred by the screening instrument and is found to not be in need of special services, thus a false negative or under-referral error. Frequencies for each of the four cells in the 2x2 array are filled in allowing essential data to be calculated. This information includes:

> "(1) The proportion of children in the criterion measure problem group, i.e., the base rate, (2) the proportion of children referred for further assessment, i.e., the referral rate, (3) the proportion of children accurately classified by

the screening measure, and (4) the over-referral and under-referral rates" (Lichtenstein, 1984).

One must keep in mind that the cutoff scores on the screening instrument can be adjusted so that more of the truly impaired children are identified even at the risk of including a higher proportion of false positives (Keogh & Daley, 1983). Also, different cutoff scores may be necessary for various populations as a result of differing base rates (Meehl & Rosen, 1955).

Chapter V

Results

Pearson-product moment correlations were computed between the Stanford-Binet: Fourth Edition (SB:FE) Test Composite and Standard Area scores and the AGS: Early Screening Profiles (AGS:ESP) Cognitive/Language Profile score, Cognitive Subscale and Language Subscale. The results are summarized in Table 1. Correlations ranged from .34 to .73, all significant at the $p<.01$ level. The lowest correlations were between AGS:ESP Cognitive Subscale and SB:FE's Quantitative Reasoning Standard Area Score ($r=.34$; $p<.01$) and Verbal Reasoning Standard Area Score ($r=.41$; $p<.01$). The highest correlations were found between AGS:ESP Language Subscale and SB:FE's Verbal Reasoning Standard Area Score ($r=.73$; $p<.01$). These data support the hypotheses that a significant positive correlation exists between the AGS:ESP Cognitive/Language Profile score and the SB:FE's Composite Standard Score and Standard Area Scores. These data also support the hypothesis that a significant positive correlation exists between the AGS:ESP Cognitive and Language subscales and the SB:FE's Composite Standard Score and Standard Area Scores.

Post-hoc analysis indicated that six of the children obtained Standard Area scores of 0 on the SB:FE's Quantitative Reasoning area and this may have resulted in lowering the predictive validity when the SB:FE Composite score was used as the criterion. For this reason, an SB:FE Partial Composite score, which excluded the Quantitative Reasoning score, was substituted

for the Test Composite score and new correlations were computed. The Partial Composite Score is a prorated score of mental ability.

A significant positive correlation exists between the AGS:ESP Cognitive/Language Profiles score and subscales scores, and the SB:FE Partial Composite score. The highest correlation with the SB:FE Partial Composite score is with the Cognotive/ Language Profile ($r=.81$; $p<.01$).

Pearson Product Moment Correlational Matrix for the AGS: Early Screening Profiles and the Stanford-Binet: Fourth Edition

	Stanford-Binet: Fourth Edition					
AGS:ESP	VR	A/VR	QR	S-TMR	TC	PC
CS	.41*	.44*	.34*	.48*	.52*	.62*
LS	.73*	.45*	.42*	.53*	.67*	.78*
C/LP	.67*	.52*	.45*	.58*	.69*	.81*

* significant at $p < .01$, N=40 in each case.

VR = Verbal Reasoning
A/VR = Abstract/Visual Reasoning
QR = Quantitative Reasoning
S-TMR = Short-Term Memory Reasoning
TC = Test Composite
PT = Partial Composite
CS = Cognitive Subscale
LS = Language Subscale
C/LP = Cognitive/Language Profile

Because the purpose of this study was to compare scores obtained on the AGS:ESP with those obtained on the AGS:ESP, standard scores and means were computed for the two tests. Means and standard deviations for the AGS:ESP and the SB:FE are exhibited in Table 2.

A scattergram was created to look at the effects of various cutoff scores on the number of false positives, false negative, true positives, and true negatives. A scattergram between the AGS:ESP Cognitive/Language Profile and the SB:FE Test Composite is shown in Table 3. A cutoff score for the SB:FE of 67 was used since this is the highest score a subject could receive within the mentally impaired range. Effects of altering the cutoff score of the AGS:ESP are shown in Table 4. A cutoff score of 86 on the AGS:ESP would be necessary to avoid any false negatives. However, this leaves 14 false positives with 17 true negatives and 9 true positives. An AGS:ESP cutoff score of 80 resulted in 2 false negatives and 6 false positives, with 25 true negatives and 7 true positives. An AGS:ESP cutoff score of 70 resulted in 5 false negatives and 3 false positives, with 28 true negatives and 4 true positives.

Table 2

Comparison of Means and Standard Deviations for Scores on the AGS: Early Screening Profiles and the Stanford-Binet: Fourth Edition

Variable	Mean	Standard Deviation
AGS:ESP		
Cognitive Subscale	84.1	12.2
Language Subscale	84.7	12.6
Cognitive/Language Profile	82.9	11.8
SB:FE		
Verbal Reasoning	82.0	14.3
Abstract/Visual Reasoning	85.6	12.4
Quantitative Reasoning	77.3	34.6
Short-Term Memory	84.2	10.4
Test Composite	78.7	16.2
Partial Composite	82.3	11.2

Table 3

SCATTERGRAM OF AGS:ESP & SB:FE

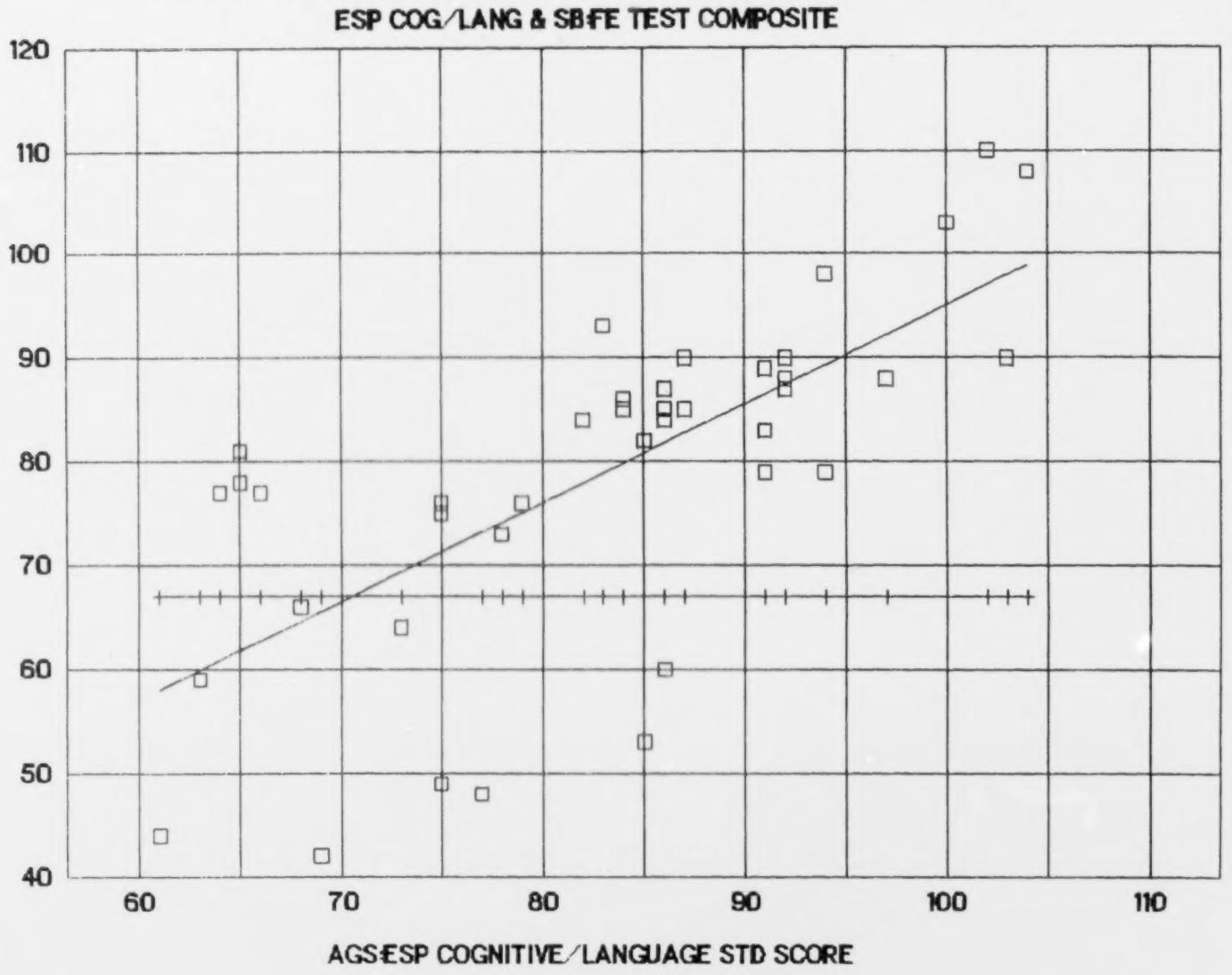

Table 4

Effects of varying the AGS:ESP cutoff score and using 67 as the SB:FE Test Composite cutoff score

AGS:ESP cutoff score=86

	AGS:ESP	
SB:FE	14 False Positives	17 True Negatives
	9 True Positives	0 False Negatives

AGS:ESP cutoff score=80

	AGS:ESP	
SP:FE	6 False Positives	25 True Negatives
	7 True Positives	2 False Negatives

AGS:ESP cutoff score=70

	AGS:ESP	
SB:FE	3 False Positives	28 True Negatives
	4 True Positives	5 False Negatives

A second scattergram was composed between the AGS:ESP Cognitive/Language Profile and the SB:FE Partial Composite Score (Table 5). Effects of altering the cutoff score of the AGS:ESP are shown in Table 6. A cutoff score of 67 was used for the SB:FE. As the plot indicates, a cutoff score of 70 for the AGS:ESP resulted in 1 false negative and 3 false positives, with 4 true positives and 32 true negatives. When a cutoff score of 72 is used for the AGS:ESP, there are 0 false negatives and 3 false positives, with 5 true positives and 32 true negatives.

Table 5

SCATTERGRAM OF AGS:ESP & SB:FE

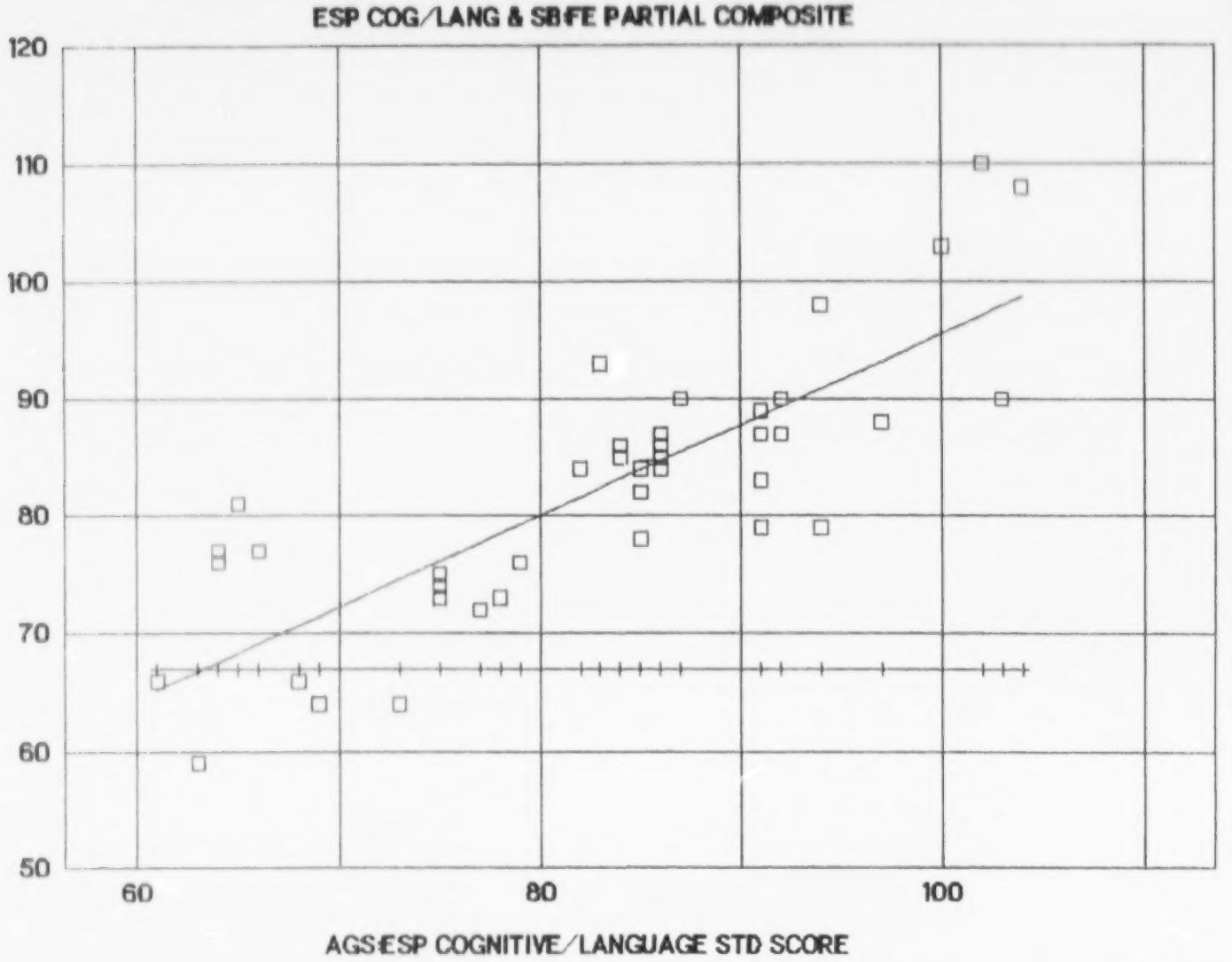

Table 6

Effects of varying the AGS:ESP cutoff score and using 67 as the SB:FE Partial Composite cutoff score

AGS:ESP cutoff score=70

SB:FE	AGS:ESP	
	3 False Positives	32 True Negatives
	4 True Positives	1 False Negatives

AGS:ESP cutoff score=73

SB:FE	AGS:ESP	
	3 False Positives	32 True Negatives
	5 True Positives	0 False Negatives

Chapter VI

Discussion

Discussion

The present study was directed toward determining the effectiveness of the AGS: Early Screening Profiles as an adequate instrument to screen for mental impairment as detected by the Stanford-Binet: Fourth Edition. The degree of concurrent validity was determined via a correlational study comparing the AGS:ESP and the SB:FE with a sample of low SES Head Start preschool children. The results support the hypothesis that there is a significant positive correlation between the AGS:ESP Cognitive/Language Profile score and the Composite Standard Score on the SB:FE, and the means and standard deviations of composite scores on both instruments are similar. Thus, scores on the AGS:ESP represent scores that are similar to those obtained on the SB:FE. The overall correlation of .69 between the AGS:ESP and the SB:FE means that as scores on one instrument increase or decrease, scores on the other instrument fluctuate in the same direction. From these data it may be concluded that although the correlation is only moderately high, mean scores for the groups are comparable and the AGS:ESP appears to be predicting performance on the SB:FE.

Post-hoc analysis indicated that six of the children obtained Standard Area scores of 0 on the SB:FE Quantitative Reasoning area. For these children, a large difference was noticeable in the correlation between the SB:FE Test Composite score and the

AGS:ESP Cognitive/Language Profile score. For this reason, SB:FE Partial Composite scores were used when a 0 on Quantitative Reasoning was achieved, eliminating the use of the Quantitative Reasoning score in determining mental ability. The degree of concurrent validity was determined via correlational study comparing the SB:FE Cognitive/Language Profile score and the SB:FE Partial Composite score. Results indicate that the correlation increased, but the level of significance did not. The overall correlation of .81 indicates the correlation is high. Thus, using the Partial Composite score for children who obtained a Quantitative Reasoning Standard Area Score of 0, appears to provide a more accurate measure of their true mental ability, as measured on the SB:FE, than using the Test Composite score.

It was predicted that there would be a significant positive correlation between the AGS:ESP Cognitive and Language subtest scores and the SB:FE Composite Standard Score. The Cognitive subtest correlated moderately with the SB:FE Test Composite score (.52). The Language subtest also correlated moderately with the SB:FE Test Composite score (.69). These correlations increased when the Partial Composite score was substituted for the Test Composite score, although the level of significanc did not. The Cognitive subscale correlation increased by 10 points to a .62. The Language subscale correlation increased by 11 points to a .78. This is a dramatic difference supporting the idea that for children who receive a score of 0 on the Quantitative Reasoning Standard Area Score on the SB:FE, a Partial Composite score should be used to determine mental ability.

It was also predicted that there would be a significant positive correlation between the AGS:ESP Cognitive and Language subtest scores and the SB:FE Standard Area Scores. All scores were correlated with the SB:FE Verbal Reasoning Standard Area Score and the AGS:ESP Language subtest being the highest (.73). The lowest correlation was between the SB:FE Quantitative Reasoning Standard Area Score and the AGS:ESP Cognitive subscale (.34). Although the correlation was significant, it is important to remember that some children received a Quantitative Reasoning score of 0 which would cause a decline in the correlation.

One reason for the poor performance of some subjects on the Quantitative Reasoning area is confusing initial directions. Wersch and Thomas (1990) found that children of preschool age often did not understand the abstract concepts of "different" and "same", and therefore performed poorly. The Quantitative Reasoning area score has also been found to have no significant correlation to several math subtests of achievement tests (Rothlisberg, 1990). Rothlisberg (1990) also noted that behavior and observations of preschool children suggested confusion to the dice-related tasks. "Quantitative tasks at this level may have misrepresented the children's actual knowledge of numerical concepts and weakened the subtest's relation to math achievement" (Rothlisberg, 1990). Kline (1990) found that Quantitative Reasoning, through confirmatory factor analysis, suggests no subtest intercorrelations for ages two through eleven, and found no evidence for a distinct quantitative factor. "...lack of evidence with regard to a distinct quantitative factor casts

doubt upon the interpretive value of the SB:FE Quantitative Reasoning Scale Score" (Kline, 1990). In a longitudinal investigation of the SB:FE with children from low income homes, Lamp and Krohn (1990) found "...wide differences between scores for individual children on this scale (Quantitative Reasoning) at ages four and six". They concluded that the Quantitative Reasoning standard area score should be interpreted with caution when administered to a preschool age population.

Hit-rate cutoff scores were used on the AGS:ESP Test Composite score to determine which scores predict the least number of false negatives (under-referrals) and false positives (over-referrals). Predictive validity has a direct and highly visible effect upon the instruments being used (Landy, 1989). A cutoff score of 67 was used for the SB:FE since this is the highest score a child can receive within the mentally impaired range. A cutoff score of 86 on the AGS:ESP resulted in no false negatives, meaning that no children go undetected by the AGS:ESP as mentally impaired on the SB:FE. However, 14 children were identified as false positives, meaning that 14 children that were detected by the AGS:ESP as possibly mentally impaired, the SB:FE scores indicated they were not mentally impaired. Further analysis indicated that the AGS:ESP detected 9 children accurately as performing within the mentally impaired range on the SB:FE (true positives). However, when one compares the 14 false positives to the 9 true positives, 64% of the children identified by the AGS:ESP as requiring further assessment are not in need of assessment on the

SB:FE. This over-refferal rate of 64% cannot only be time consuming, but costly as well.

A second possible cutoff score for the AGS:ESP Test Composite score was set at 80. This resuleds in 2 children being identified as false negatives (under-referrals). These are children who "passed" the AGS:ESP but perform below the mentally impaired range on the SB:FE. Not identifying children who rewuire special services is unacceptable. Children with impaired cognitive abilities need to be detected as soon as possible so that early intervention services can begin. Only 6 subjects fell within the false positive category, thus eliminating some of the unnecessary evaluations the cutoff score of 86 was used.

A third possibility of a cutoff score of 70 was not considered since it detected fewer true positives (4) than false negatives (5). This means that more children are not being detected who are in need of intervention services, than children who are successfully being detected. It is important to consider ethical guidelines when screening children, making sure that as many children as possible are being detected. Administrators should not raise the cutoff score knowing that children in need of services are not being detected.

No cutoff score on the AGS:ESP appears to be ideal for accurately identifying children in need of services without some under-referrals and over-referrals. However, using the SB:FE Partial composite score with the AGS:ESP Cognitive/Language Profile score resulted in higher validity of the AGS:ESP.

Using a cutoff score of 70 resulted in only 1 false negative (under-referral) and 3 false positives (over-referrals), with 4 true positives and 32 true negatives. This is a more accurate hit rate, yet the 1 false negative indicates that one child would still go undetected as in need of intervention services. To correct this, a cutoff score of 73 was used thus creating no false negatives (under-referrals) and only 3 false positives (over-referrals). By using this cutoff score of 73 with the AGS:ESP, no children are undetected by the AGS:ESP screening instrument. However, there is still a 40% over-referral rate.

When determining cutoff scores for a screening instrument, one must consider what type of strategy is ideal for that particular situation (Cascio, 1978). In this situation, one must consider how many underreferrals and overreferrals are affordable.

One must also consider the confidence interval for the child being assessed. Confidence intervals take measurement errors into account. The range for confidence intervals on the AGS:ESP range from $\pm$ 4 to $\pm$ 10. When taking into account the confidence interval, a child whose AGS:ESP score is above the cutoff score without the confidence interval, may fall below the cutoff score when taking the confidence interval into account. Thus, Children who score near the cutoff score, but not below, may be considered for further assessment as a result of the confidence interval (Harrison, 1990).

Implications for Future Research

Due to the fact that the AGS:ESP is a newly developed instrument, future research is important to determine its usefulness with a variety of populations. It is important to remember that the cutoff scores used to detect overreferrals and underreferrals in this study are only accurate with the population indicated. Cutoff scores will vary with each population. A replication of this study on various populations would provide important information on what cutoff scores should be used with a specific population of children.

Also, replications of the current study with different populations of early childhood students may help to support its usefulness for predicting the intellectual ability of the preschool population as a whole. A screening instrument used to detect children in need of intervention services should be accurate with all populations.

Further, concurrent validity studies comparing the AGS:ESP to other instruments which assess preschool age children would help determine the usefulness of the screening instrument when used as a predictor. This would provide comparative data against other assessment instruments, as well as information concerning which instruments the AGS:ESP most highly correlates with.

Chapter VII

Summary

The AGS: Early Screening Profiles instrument has been recently introduced as a screening instrument for predicting mental ability. The current study was conducted to determine the degree of concurrent validity between the AGS:ESP and the SB:FE. The target population for this study was children from St. Clair County in Illinois who attended the Head Start Program. Because this population was used, The SB:FE was used as criterion since it is an instrument currently being used by psychologists to detect mentally impaired children.

It was hypothesized that there would be a significant positive correlation between the AGS:ESP Cognitive/Language Profile score and the SB:FE Test Composite score. A second hypothesis was that there would be a significant positive correlation between the AGS: Cognitive/Language Profile and the SB:FE Standard Area Scores. A third hypothesis was that there would be a significant positive correlation between the AGS:ESP Cognitive and Language subscale scores and the SB:FE Test Composite score. Fourth, It was hypothesized that there would be a significant positive correlation between the AGS:ESP Cognitive and Language subscale and the SB:FE Standard Area Scores. All of these hypotheses were supported. Correlations were statistically significant with the highest being between the AGS:ESP Language subscale and the SB:FE Verbal Reasoning subscale. The lowest correlation was between

the AGS:ESP Cognitive subscale and the SB:FE Quantitative Reasoning subscale.

Post-hoc analysis indicated that when children achieved a score of 0 on the Quantitative Reasoning subscale of the SB:FE, and a Partial Composite score was used, a higher level of significance occurred between the AGS:ESP and the SB:FE.

Finally, hit-rate cutoff scores for the AGS:ESP were varied while the SB:FE cutoff score was maintained at 67 to look at its ability to detect mentally impaired children.

This study supports the hypothesis that the AGS:ESP and the SB:FE produce similar results, and thus the AGS:ESP is a useful screening instrument for use with preschool children from low income families.

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